

EP 009904419

06/20/00

June 20, 2000

Müller-Boré & Partner

Official ref. no.: PCT/EP99/04419 M20 06 00

Applicant: DLW AG

"Flexible multilayer flat material with reinforced cover layer"

Our reference: D 2659 - py / jh

**Claims**

*Sub*

*Av*

1. Flexible multilayer flat material comprising at least one cover layer with at least one flat reinforcement material positioned in the cover layer, whereby the reinforcement material is completely surrounded by the coating compound constituting the cover layer, so that a closed layer is formed around the reinforcement material, whereby the reinforcement material is a nonwoven material with a weight in the range from 9 to 50 g/m<sup>2</sup>.
2. Flat material according to claim 1, whereby the nonwoven material is a wet nonwoven material, a dry nonwoven material, or a spunbonded nonwoven material.
3. Flat material according to claim 2, whereby the nonwoven material is a cellulose nonwoven material.
4. Flat material according to one of the claims 1 to 3, whereby the nonwoven material is printed.
5. Flat material according to one of the claims 1 to 4, whereby the thickness of the cover layer is at least 90 µm.
6. Flat material according to one of the claims 1 to 5, whereby the coating compound for the cover layer is based on a material selected from the group of plastisols, organosols, dispersions, or lacquers.
7. Flat material according to claim 6, whereby the plastisol is a PVC plastisol.
8. Flat material according to claim 6, whereby the coating compound for the cover layer is a material containing polyreaction products, whereby the

**ART 34 AMDT**

06/20/00

June 20, 2000

Müller-Boré &amp; Partner

2 M 06/20/00

*Sub  
at  
PCT*

polyreaction products can be obtained by the reaction of at least one dicarboxylic acid or polycarboxylic acid or their derivatives or a mixture of these with at least one epoxidation product of a carboxylic acid ester or a mixture of these epoxidation products.

9. Flat material according to claim 8, whereby the dicarboxylic acid is maleic acid, itaconic acid, fumaric acid, succinic acid, methyl succinic acid, malic acid, or furan dicarboxylic acid or a mixture containing at least two of these acids.
10. Flat material according to claim 8, whereby the polycarboxylic acid is selected from citric acid or aconitic acid.
11. Flat material according to one of the claims 8 to 10, whereby the derivative of the dicarboxylic acid or polycarboxylic acid is an anhydride or partial ester.
12. Flat material according to claim 11, whereby the alcohol component of the partial ester is a polyol.
13. Flat material according to claim 12, whereby the polyol is dipropylene glycol, a propane diol, a butane diol, a hexane diol, a hexane triol, glycerin, or pentaerythritol, or a mixture containing at least two of these polyols.
14. Flat material according to one of the preceding claims 8 to 13, whereby the mixture of at least one dicarboxylic acid or polycarboxylic acid or their derivatives is a mixture of a partial ester of maleic acid anhydride and dipropylene glycol with citric acid.
15. Flat material according to one of the claims 8 to 14, whereby the epoxidation product of a carboxylic acid ester contains more than one epoxy group per molecule.

*Approved  
Anne*

06/20/00

June 20, 2000

Müller-Boré &amp; Partner

3 M 06/20/00

16. Flat material according to one of the claims 8 to 15, whereby the epoxidation product of a carboxylic acid ester is epoxidized linseed oil, epoxidized soybean oil, epoxidized castor oil, epoxidized rapeseed oil or vernonia oil or a mixture containing at least two of these epoxidation products.

17. Flat material according to one of the claims 8 to 16, whereby the cover layer additionally contains one or more fillers.

18. Flat material according to one of the claims 1 to 17, whereby the cover layer (II) is transparent.

19. Flat material according to claim 18, whereby the coating compound for the cover layer contains no more than 2 weight percent of filler.

20. Flat material according to one of the claims 1 to 19, whereby one or more flat nonwoven materials are additionally located under the cover layer.

21. Flat material according to claim 20, whereby the nonwoven material located under the cover layer is a glass fiber nonwoven material.

22. Flat material according to one of the preceding claims made of at least one carrier layer (I) and at least one previously defined cover layer (II), possibly one backing coating (III) located under the carrier layer (I) made of a chemically or mechanically foamed foam layer, and possibly a compact or base coating (IV), which is positioned between the carrier layer (I) and cover layer (II) and/or between the carrier layer (I) and backing coating (III), whereby the coating compounds for the layers (III) and (IV) are based on a material according to one of the claims 6 to 17.

23. Flat material according to claim 22, whereby a protective layer (VI) of unsaturated curable

06/20/00

EP 009904419

June 20, 2000

Müller-Boré & Partner

4 M 06/20/00

lacquer systems is located over the cover layer (II), whereby the polymers or copolymers for the lacquer systems are selected from the group consisting of polyacrylates, polymethacrylates, polyurethanes, and mixtures of these.

24. Process for the production of a flexible multilayer flat material according to one of the claims 1 to 23, comprising the application of the material constituting the cover layer on one or more, possibly printed, flat nonwoven materials in such a way that the nonwoven material is completely impregnated, and the subsequent hardening of this material for production of the cover layer, and the application of this type of cover layer to a carrier.

*Sub A2*  
25. Process according to claim 24, whereby one or more flat nonwoven materials are additionally located under the cover layer before the hardening of the cover layer.

*Added a3* >

ART 34 AMDT

## Fig. 1

Deckschicht = cover layer  
Verstärkermaterial = reinforcement material  
Chem. Schaumstrich = chemical foam coating  
Grundstrich = base coating  
Täger [sic] (should be Träger) = carrier  
Rückenstrich =backing coating

## Fig. 2

Nutzschicht = wear layer  
Oberflächenstruktur = surface texture  
Textiles Vlies = textile nonwoven material  
Glasvlies = glass fiber nonwoven material  
Rückenschicht = backing layer

## Fig. 3

Plastisol = plastisol  
Glasvlies = glass fiber nonwoven material  
Zellstoffvlies = cellulose nonwoven material  
Geliertrommel = gelling drum